

Dynamics Evaluation

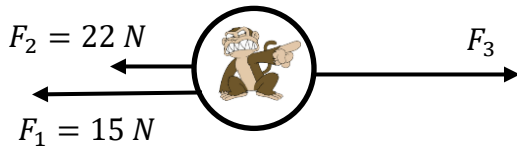
Name: _____ Date: _____

$$v_2 = v_1 + a\Delta t \quad \Delta d = v_1\Delta t + \frac{1}{2}a\Delta t^2 \quad \Delta d = v_2\Delta t - \frac{1}{2}a\Delta t^2 \quad v_{av} = \frac{\Delta d}{\Delta t} = \frac{(v_1 + v_2)}{2}$$

$$v_2^2 = v_1^2 + 2a\Delta d \quad \Sigma F = F_{net} = ma$$

You must show all of your work, FBDs and units to get full marks. Put a box around your final answers.

1. [5 marks] Determine the unknown force acting on Matrix the Monkey (5 kg) causing him to accelerated to the left at 1.8 m/s/s.



2. Mighty Mouse ($m = 0.243\text{ kg}$) is being pushed by three forces; 6.1 N [right], 2.5 N [left] and 10.5 N [right].
- a) [4 marks] Determine the net force and acceleration of Mighty Mouse. Include a FBD.



- b) [4 marks] If Might Mouse was moving at 5.0 m/s, how far (distance) will he have traveled by the time he reaches a speed of 11.9 m/s?
- c) [2 mark] Determine the size and direction of a 4th force that would cause Might Mouse to stop accelerating. Show your work/Explain your reasoning.

3. [5 marks] The driver of a 900 kg car presses the gas causing a forward force of 1050 N forward on the car. Air resistance exerts a force of 86 N on the car and road friction exerts an additional force of 43 N on the car. If the car was moving at 4.5 m/s initially, calculate the speed it would reach after 5 seconds. Include a FBD.

4. [5 marks] A mini-tank is accelerating at 5 m/s^2 to the right. State a three force combination and mass of the mini-tank that will result in this acceleration.

